

Abstract:

Red, intermediate, and white axial muscle fibres of African lungfish were studied using histochemical techniques and electron microscopy. Gross dissection revealed the presence of a small wedge of red coloured muscle along the lateral line. This wedge was shown by histochemical demonstrations of lactate and succinate dehydrogenases, of adenosine triphosphatases, and of lipid to be composed of a mosaic of red and intermediate fibres measuring 23.63 and 34.30 micrometer in average diameter, respectively. The bulk of the myotome was composed of white fibres having an average diameter of 67.35 micrometer. Mitochondrial density, capillarity and lipid content were very low for all fibres. These data suggest that the axial musculature is geared primarily for anaerobic function. The mosaic arrangement of fibres, and the lack of a subsarcolemmal band of mitochondria suggests that the lungfish have a muscle organisation that is transitional between lower vertebrates and amphibians.